

Hobbies

WEEKLY

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A SIMPLE SMALL TOY ENGINE & TENDER

WE give here working details and instructions for making the attractive little pull-along toy engine and tender shown in the illustration on this page. The total length of engine and tender combined is $12\frac{3}{4}$ ins., while its height and width are $3\frac{1}{4}$ ins. and $2\frac{1}{2}$ ins. respectively.

The toy is very strongly constructed to withstand plenty of rough usage and hard "wear and tear". Wood $\frac{3}{8}$ in. thick is used throughout except for the three boiler sections which are $\frac{1}{2}$ in., and glue and fine wire nails will hold all the parts together.

Tools and Materials

The fretsaw is used for the cutting to outline of all parts of engine and tender, and the shaping of the boiler and the roof of the cab will be carried out with knife, rasp, wood file and finally coarse and fine glasspaper.

Any soft wood can be used as the finished toy will be painted in bright colours on completion.

Commencing work upon the engine we first look at the detail Fig. 1 which gives the general dimensions. Then, from Fig. 2, we get an idea as to how the boiler is made, and this part will be the first to undertake. Three pieces of wood are cut to shape, the outside pieces A (see Fig. 2) being 7 ins. long and the middle piece B, $4\frac{3}{4}$ ins. long. All three pieces are $2\frac{1}{2}$ ins. wide.

From Fig. 3 it will be seen how the cab end of pieces A will be shaped, the other ends being cut square across as seen in Fig. 2. When the three parts are cut to shape and glued together the rounded top forming the boiler is carried out as previously described.

The next two pieces to make are the cab sides C, and full measurements are given for one of these in

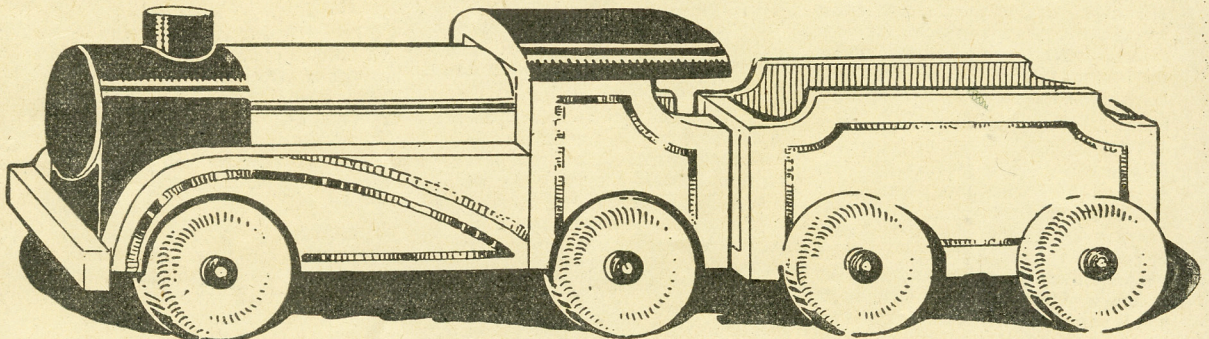
Fig. 5. The position they will take on the boiler sides A is shown in Fig. 4. The side view Fig. 1 also gives their positions.

Completing the Cab

Next we make the two side projections D, and these are each $4\frac{1}{8}$ ins. long by $1\frac{1}{4}$ ins. wide. The centre for describing the semicircle for the recessed wheel is shown by the measurements. Cut the two pieces carefully and smooth and true up the surfaces before gluing them to the sides of the boiler.

The roof to the cab, E, will be made next, and it consists of a plain $2\frac{1}{2}$ in. square of wood. It may be roughly shaped at first before it is glued in place on the cab, then afterwards rasped and filed and finally glasspapered and made smooth for the painting.

To make the floor of the cab it will be found that a small block of wood



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measuring $1\frac{1}{2}$ ins. by $\frac{1}{2}$ in. square will be wanted. It will be glued to and between the two sides A of the cab. The buffer plates F are pieces $2\frac{1}{2}$ ins. long by $\frac{1}{2}$ in. wide, and are made from the $\frac{3}{4}$ in. wood.

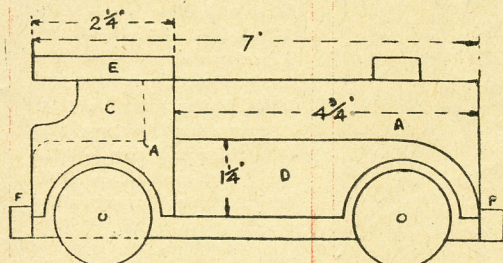


Fig. 1—Side view and dimensions of engine

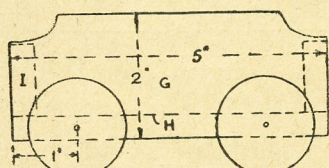


Fig. 6—Side view of Tender

The positions for screwing on the eight $1\frac{1}{2}$ in. diameter wheels of the engine are easily ascertained from the general make-up of the parts or from Fig. 1. A set of the eight wheels for engine and tender can be bought from Hobbies Ltd. at 2/- for the set.

They should be attached by round-head screws not less than 1 in. in length. Thin metal washers should be put under the screw heads, but this is not absolutely essential.

The funnel is a plain disc of $\frac{1}{2}$ in. wood shaped and nailed in place. The best way to get the correct shaping to fit the curvature of the boiler,

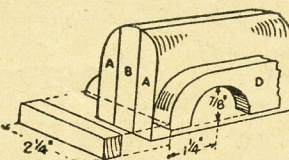


Fig. 2—Building the boiler

is first to bend a piece of glasspaper round the boiler itself, then rub the funnel disc on this until sufficient wood is removed. This allows the disc to saddle-down properly.

The tender is another simple item, the outline of which is given in Fig. 6.

First, the floor H is made, and this is a plain rectangular piece measuring 5 ins. by $\frac{3}{4}$ in. To the side edges of this piece the two sides G are glued and nailed. The simple top shaping to the sides is easily drawn in and cut with

the fretsaw to a clean smooth curve.

To form the ends of the tender two plain pieces J are put between the sides, these pieces measuring $1\frac{1}{2}$ ins. by $\frac{3}{4}$ in. by $\frac{3}{4}$ in. Finally, the wheels are screwed on, the centres for these being 1 in. distant from the ends, as seen in Fig. 6.

The engine and tender are eventually linked together by a hook and

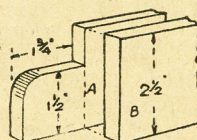


Fig. 3—Cab end

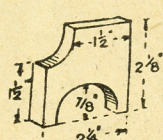


Fig. 5—Cab side

eye. At least two coats of paint should be applied to all the woodwork, or perhaps one coat of good enamel would be found sufficient. Red or green are suitable as a body colour, with black for the front part of the boiler, the chimney and the roof of the cab. If it is desired to carry out the panelled effect shown in the illustration, then this could be done in some contrasting colour.

A useful addition to the boiler front of the engine would be a circular disc of either stout card or thin wood. This, when glued on and painted black, would hide the end grain of the three pieces of wood forming the boiler.

Hints and Tips for Handymen—

PERSPEX, such as the clear stuff, makes a useful cement for repairing chinaware, pottery, fountain pens, etc. It can be dissolved in trichloroethylene and chloroform, or equal parts of acetone and amyl-acetate. Owing to the hard nature of Perspex, however, the chemicals work slowly, and it may take several days or a week for the solvents to produce a thick, clear solution which can be used as a cement.

THE brown, rusty spots on old pictures, or the surround of white card, is usually due to dampness and traces of iron, and the trouble is known as "foxing". The spots, if on a water-coloured picture, may be touched with a solution of hydrogen peroxide, or even Milton. Use a pencil brush, and repeat the treatment, if necessary. This will leave small white spots requiring to be expertly touched up with water colour.

WHITE glue, which is generally used in violin making, consists of good hide glue (10 parts), zinc oxide (5 parts) and water (10 parts). Prepare the glue in the normal way by steeping and boiling. When prepared, stir in the zinc oxide. This makes a glue which sets dead hard and is very strong. A casein glue is an alternative adhesive to use. This is obtainable in tins as a white powder, requiring the addition of water.

DUPLICATING ink, for use with rubber stamps, is made from aniline dye (3 parts), water (15 parts), alcohol (15 parts) and glycerine (50 parts). The water and glycerine are mixed, then the dye dissolved in the spirit, and the dissolved dye added to the water-glycerine mixture.

WOOD can be made waterproof with mineral salts. Mix together 6 parts boric acid, 5 parts sal ammoniac and 3 parts of borax. Put into a bath containing 100 parts of water. Items to be waterproofed are immersed in the solution for a few days, or if too large, may be brushed with the solution, applying several applications. In the latter case, the method gives mainly an exterior waterproofing to the wood. The application of wet-wax, or wax floor polish, is an alternative.

HOT plate marks on a polished surface may be treated by rubbing with camphorated oil, or equal parts of turps and linseed oil. Wipe afterwards with a cloth dipped in vinegar to remove traces of the oil. The method does not guarantee that marks will be completely removed. It may be effective—or have no effect at all. It is a remedy worth trying, however. Perfume marks may also be treated with the oil preparations.

BEFORE glazing window panes in new frameworks, always make a

point of applying a coat of thin paint to the rebates. When this dries, the putty will have a more effective grip than it would on the bare wood.

GLAZED tiles, for fireplaces, scullery walls, etc., can be cut with a hacksaw, if soaked in water. However, the cutting is slow, and the blade is soon ruined. The best way to cut glazed tiles is by means of an ordinary glass-cutter, such as the wheel or diamond type. The glazed side is scored, rather like glass, then broken at the score. Generally the break is neat and clean. A bad score, however, may mean the tile breaking roughly so that "chipping" with nippers may be necessary to have the broken edge straight.

WHEN fitting a new bar to a back door, etc., make a point of having the metal catch slightly higher than the sliding bar. Reason: The door may sag, as most doors do, so the catch may be troublesome until shifted. A new back door, without braces, will swell and sag.

THE best way to cut glass tubing, or test tubes, is with a diamond-tipped glass-cutter. The tubing should be supported on V-shaped blocks. As the glass is turned, the cutter is pressed against it to make a complete score. By tapping the glass at the score lightly, the waste portion should break off easily and neatly.

There is nothing really difficult in making A JACK-IN-THE-BOX

READING an interesting article lately, the writer noted a comment on the absence of that old-fashioned and once popular toy, the Jack-in-the-Box. The comment was true, but one wonders how it comes about that this particular toy has quite disappeared. At any rate here is a description of its construction, which may help to resurrect it for the coming generation. It is an amusing little article, just the thing to make for a kiddy especially for Christmas.

The box itself is shown in Fig. 1 and can be made from fretwood $\frac{1}{4}$ in. thick, the dimensions allowing for a Jack of the size given. The box could well be made from any common wood available, but the interior dimensions should not be less than $3\frac{3}{4}$ ins. square for the Jack illustrated. The box can be afterwards covered with fancy paper to look attractive.

Loose Bottom

The bottom of the box should be left loose, for convenience in fixing the spring and coat of the figure; it should, of course, be nailed on later. A plain lid is provided, hinged to

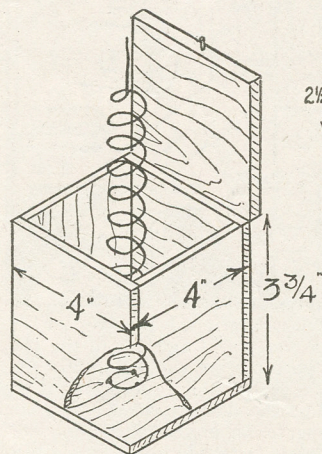


Fig. 1—The box and spring

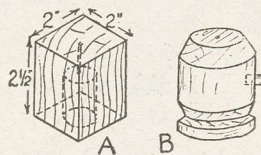


Fig. 2—The jack block

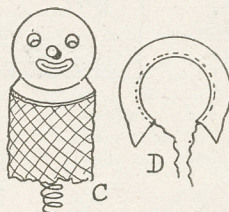


Fig. 3—Forming the head

open easily. Any cheap metal hinge will do, or even a strip of tape glued over the joint will suffice. The box sides are nailed and glued together. The interior of the box sides is covered with paper, also the lid. The outside is also covered, but is better left to the last.

The motive power of the Jack is a strong helical spring. For this a few feet of medium steel spring wire will be required, and if none is available the small length required could probably be bought at a music shop. That used to string the treble notes of a piano might serve. About 2 ins. of the wire should be pushed through

a slot cut in one end of piece of $\frac{1}{2}$ in. or more round rod, then the remainder should be tightly wound round the rod, slid off and pulled out to about 7 ins. long.

Bend the straight piece to stand vertical in the centre of the spring, then fasten the bottom of the spring to the bottom of the box, letting it stand up the centre, as shown at Fig. 1.

A good way to fasten the spring down is to use small wire staples—three in number. These are pushed through holes in the bottom of the box, from outside, and the ends twisted round the lowest coil of the spring at equal distances apart. By driving these staples from the outside, no sharp ends will be left to scratch little fingers.

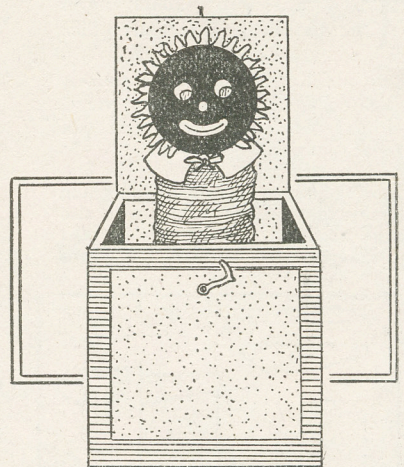
The Jack is easily made, the method not requiring any carving worth troubling about. First a block of deal will be required, cut to the dimensions given in Fig. 2 A. If this cannot be cut from one piece of deal, two or more thicknesses can be glued together, but they should be cramped tightly after gluing for a strong joint.

From the centre of the bottom, upwards, bore a 1 in. diameter hole about two-thirds of the distance, and from there bore a fine hole through the remainder to the top of the block, as shown by the dotted outline in the diagram.

The next stage is shown at B. Here the block is chiselled cylindrical shape and bevelled off at the top. At $\frac{1}{2}$ in. upwards from the bottom saw a line round, $\frac{1}{4}$ in. deep, and bevel each side of it to the line to make a V-shaped incision round. In the centre bore a $\frac{1}{4}$ in. hole and glue therein a round piece of wood, letting it project just $\frac{1}{4}$ in. This will serve as the nose of the figure.

From the V-shaped incision upwards, the wood should now be rounded off to make a ball shape. A little work with file and glasspaper will do this part. Take the block and push it over the spring, until the straight upward piece of the latter emerges through the hole in the top of the block. There it is twisted to a small ring to fix it securely. The features can then be clearly defined, as in the drawing with a lead pencil.

Colour the face, back and front, with black paint, leaving only the eyes



and lips. Put in the pupils of the eyes, as shown, in a green colour, and the lips, red. The dress of the figure, if the covering can be dignified with such a name, is a length of any soft fancy material at hand, wide enough to reach round the base of the figure with an overlap of 1 in., and long enough to reach from the head to the bottom of the box, when the Jack is fully "sprung".

Dressing

Fix the dress round with glue and a few small nails, and then nail it to the bottom of the box. The general appearance of the Jack will then be as shown in Fig. 3, C. The bottom of the box can now be glued and nailed on.

Round the neck of the figure a paper or linen collar should be tied. Cut it to the shape shown at D, hem the inner edge, and in the hem thread a short length of coloured wool or similar material, by means of which the collar is tied at the neck, and a neat bow to finish it off. Complete the figure to give it a "golliwog" appearance, with a narrow strip of fur, glued over the head across the centre.

The outside of the box should be covered with a fancy, or coloured paper, to make it look pretty. Finish off the job with a hook fastener to keep the lid down. It will be necessary, of course, to test the Jack-in-the-Box, to see it springs upwards when the lid is released, and does not catch anywhere.

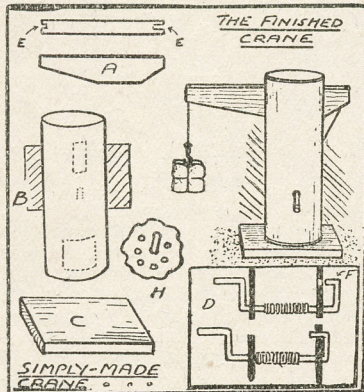
HOBBIES HANDBOOK

1949 Edition — 68 pages — Large design sheet for Model Stage Coach. Colour Air Picture Sheet. Of Newsagents, Price 1/- Post Free 1/2 from Hobbies Ltd., Dereham, Norfolk.

A few odds and ends can be used in these two TOYS FROM SCRAP

THE toy-maker should never despise ready-made items which will just do for this or that, say, a tin which if painted will act nicely as a boiler, or a card box which, without alteration, can form the major part of a model house.

The model crane shown in the first drawing follows this idea closely and is particularly easy to make. It is also quite realistic. The part (B) is a scouring-powder container and forms



the main tower, while other items needed are a square piece of wood for the base (C), a long piece (A), shaped as shown, for the horizontal jib which this sort of crane has, some pliable wire and a length of twine.

Cylindrical Pillar

Having obtained the container, which it will be found is made up of a cylindrical card body, with metal ends, cut in it four openings with a sharp blade as shown—the container being inverted. Two, measuring 1 in. by 1½ ins. and located ¾ in. from the top (one being on either side), are made for the jib to go through, the fitting being as tight as possible without warping the card.

The third hole comes about half-way down and is in the nature of a vertical slot, being eventually to take the cord from the spindle to the jib, whilst the fourth hole is about ¼ in. from the base and is to allow of bolting the carton to the under piece of wood. If carefully taken out none of these openings will in any way weaken the general make-up of the carton.

The holes made, the "tower" can now be secured to the rectangle (C) by a small bolt going through the centre of the wood and one of the sprinkler holes of the carton which, of course, are now at the bottom. Cut a recess on the under side of the wood to take the head of the bolt, which is tightened up by holding the nut with the fingers

inserted in the opening, a screwdriver doing the turning. The joint, it will be found, is very firm.

Winding Gear

Next make and fit the spindle, handle and locking-gear, all of which are made from the one piece of wire as (D). First bend one end of the wire to the shape indicated on the right-hand side.

Pass the length through two level holes pierced in the carton sides and finish by bending the further end to the handle shape as per the left-hand side. Care should be taken while doing this not to tear the card "bearings".

Now put in the jib. This is shaped as (A) and as stated should fit tightly through the holes in the top of the carton but glue can also be used to make the job firmer still.

Finally thread a length of the string from the spindle where it must be wound round several times tightly and glued up through the vertical slot in the back, over and along the top of the jib, making use of the notches (E) which keep it in position, and so on to the hanging hook.

The string should be very pliable (of the kite cotton variety) and the notches (E) smoothed to make sure of easy running. It will help matters if as well as the hook at the further end there is a small leaden weight, as this will keep the string taut.

If trouble is experienced in getting the string to grip on the smooth spindle, this may be overcome by removing the length and filing two flat sides about the centre, the end of the string is then laid horizontally along one of these "flats" and bound tightly with glued cotton. A turn or two of the string glued completes the connection.

Colouring

The model should be finished in bright colours. The load is lifted by rotating the handle and locked in any desired position by pulling the spindle sideways so that the projection (F) engages in one of a series of holes punched in the carton as (H) around the spindle at the correct radius. Six or seven holes are quite sufficient.

A Mortar

The second model shown here made from 'things that are' is a cotton reel mortar which is capable of firing match sticks for quite a long distance and at a really high velocity.

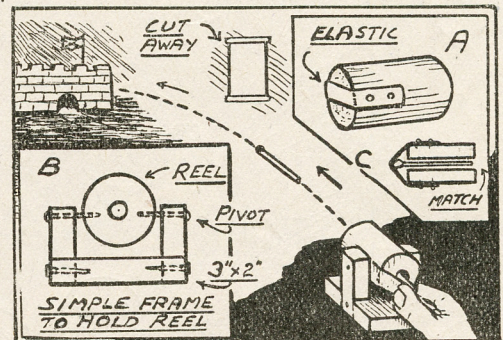
Required are one of those longish

cotton reels sometimes used for holding thread, a length of strong wide elastic and a few pieces of wood. Trim the two lips off the ends of the reel and smooth well down with glasspaper. This will give a thick barrel as (A). Now take the elastic and fasten it across the one end of the reel with two sprigs at either side so that it will withstand a good pull.

Next make the simple frame as shown in the bottom left-hand sketch. This must be sturdy. It is built up of three pieces only, a base 3 ins. by 2 ins. and two sturdy side-pieces, just high enough to allow of small nails or screws going through into the middle of the reel. To give strength the base is recessed at the middle of each edge and the uprights are fitted in, being secured by glue and a single screw. The bottom right-hand sketch makes the fitting quite clear.

The height of the reel should be such that it can be tilted up and down a little to aim at various things.

The mortar is now complete. To fire, a matchstick is pushed into the front opening and then elastic and



match are gripped together at the back and pulled away from the reel. Let go suddenly, the match now flies out at really a high speed, and if the pull on the elastic has been good and strong, for an amazing distance.

Unless fastened down to something firm, of course, one hand must be pressed on the "mortar" while the other pulls on the elastic and match.

BOOT POLISH POLISH

BOOT or shoe polish can be used for "waxing" various items. For example, an attache-case made from wood, stained with black spirit stain, then rubbed with black shoe polish, takes on a dull, black sheen which, by constant brushing, can be brightened.

A hollow pipe, rope and odds and ends can be turned into A STANDARD LAMP

AS handicraft workers will know, some articles turn out about the same as you expect them, some are disappointing, while others are definitely better than the conception held in the mind.

The writer can testify that the standard lamp described here falls into the latter class.

To make the lamp—a pole, 5ft. long was first obtained. Various staves and rods were examined and an ideal type was at length found in the handles that are sold for garden tools, i.e. hoes, etc. These are longer than even the longest broom handles and are nicely turned, straight and true. Their diameter is about $1\frac{1}{8}$ ins., which gives a strong and well-proportioned "standard" for the lamp. Indeed, it was found that when covered with the rope a diameter little short of ideal was obtained.

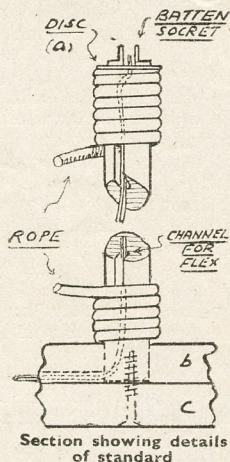
The Pillar

The "pole" obtained, the next thing is to take out a channel down its entire length of sufficient depth to accommodate a usual electric flex, but as narrow as possible. This can be done with a chisel or gouge or any one of the several other tools found in a woodworker's room. The channel should be as straight as possible, but absolute accuracy is not essential.

The pole is now wrapped from end to end in ordinary plaited clothes line. It was found that a 27-yard line exactly completed the length, the cost of this being about 5/-.

To make a neat start at the top, the covering of the line is stripped back from the core for a few inches. The core is then cut away and the covering pulled straight again. This it will be found gives a tapering end which can be secured for about half a circumference with small sprigs.

The next coil (now of full rope)



comes close round under this, eliminating any obvious beginning. From here on the rope is wrapped steadily round and down the pole, keeping the tension the same all the time. The wrapping is best done by turning the pole with one hand while the other guides the rope. A second person to help is an advantage.

If the channel for the flex is deep, the wire may be fed in afterwards, but if not the flex must be in position as the winding proceeds.

On reaching the bottom the rope is finished as begun by taking out a length of core and fastening down with sprigs.

At the top end of the pole a disc of thick linoleum (a) carefully cut to the same diameter as the coil of rope, is secured in position. This prevents any danger of the rope riding up and also finishes the top of the standard neatly.

Top Fittings

The fittings at the top are a standard batten socket, and a holder and switch combined, with externally threaded neck to fit in the socket. A shade frame and the shade completes this section. Shades can be got in many prices and sizes, but a round one of about 2ft. diameter should be chosen and, if possible, in cream. Anyone clever at the work could make their own shade—instructions often being given.

For final appearance the "balance" of the top end is rather important, as nothing looks worse than a too-small shade on the end of a fairly long shank. A 2-foot shade and 5-foot standard of $1\frac{1}{8}$ in. diameter, which is over the rope, gives a very pleasing effect.

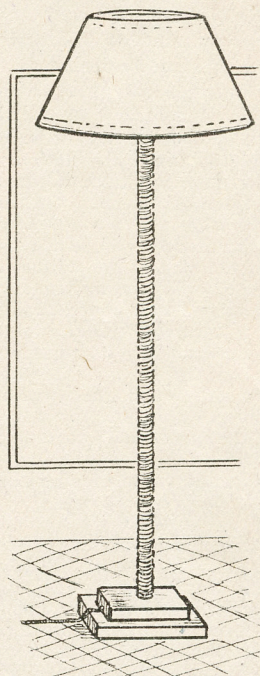
Now for the foot. This is made up of two rectangles of wood (b) and (c), the top one being 8 ins. square and the lower 12 ins.

Get Rigidity

The top rectangle is bored carefully in the centre to take the end of the pole, and for final rigidity it is worth going to some trouble to get the fit perfect and also to see to it that the pole and rectangle are at a 90 degrees angle. On the underside of this piece a channel is also cut from one side to the middle hole. This obviously is to take the flex and lead it out.

The smaller rectangle is now attached to the larger by four screws, the end of the flex lying along the channel.

Now glue the end of the pole—which must be cut dead square and inserting in the hole in (b)—with the flex looking towards the channel, press right home. If slightly tight so that some little pressure has to be used, so much the better.



When right home, turn the lamp on its side and insert the screw as shown through the bottom rectangle and into the bottom of the pole on the further side from the flex channel. Take care not to pierce the covering of the cable. With the screw and glue it will be found that a very firm joint is secured.

For the base pieces the writer used two rectangles of mahogany, but of course any suitable rectangles might be employed. Too lightweight wood should be avoided.

Colouring

Finally comes colouring. Some suggest painting the top and base of a lamp of this kind in one colour, but if clean, the rope looks quite well without any colouring whatsoever. If reasonable care has been taken in the making and the rope kept unmarked, there is no reason why it should not keep in a clean state for quite a long time.

The base, however, needs treatment, and with the rope left white this is best finished in the same colour as the shade, cream if it is cream, green if it is green, etc.

Finally, it is good if the flex can be obtained in the same colour as the general motif of the lamp. Flex can now be bought in most places in several colours—a yellow-covered flex being quite popular. Consequently if this is the tone you have adopted there should be no trouble in getting a match.

How to construct the Station when building your MODEL RAILWAY

NEARLY every owner of a model railway wants to make stations to enhance the realism of the track, but is generally deterred from trying his hand because he does not know the proportions of the various buildings comprising the station. It is probably for this reason that really good models of stations are comparatively rare.

Now the first thing to be done is to consider the plan of the station it is proposed to build, bearing in mind the space available on the model railway layout. Naturally the size of the station increases with its importance, and as on the majority of model railways it would be well-nigh impossible to reproduce a really big station, the appended photograph of a typical small through station shows a type eminently suitable for modelling.

"O" or "OO" Gauge

In reduced model form the length of the platform is 42ins. in "O" gauge, which is equivalent to 21ins. in "OO" scale; which will accommodate a four-coach train and locomotive. The platforms can, of course, be extended as desired either side of the station buildings, which, incidentally are on the "down" side only. Communication with the other platform is by means of either a subway or a footbridge.

Reverting to the main buildings, the most important is the station-

master's house, the upper story of which is residential and the lower housing the booking hall and office. To comply with Board of Trade requirements there must be the usual lavatory accommodation (C on all diagrams) and a clock.

Now for methods of construction.

In "OO" gauge, cardboard cut to sizes shown will be found very effective, particularly if reinforced with square wood blocks inside each corner. In "O" gauge it may be found more satisfactory to construct the buildings of fretwood or plywood, using normal fretwork methods for cutting out the doors and windows.

Suitable Material

The writer has, however, seen many scores of beautiful "O" gauge model buildings constructed from hot-pressed board or Bristol board (as used in a drawing office), the joints being made with "Seccotine" and the structures being made finally damp-proof by painting them with shellac varnish before the application of the final colour-coat or "brick" papers.

There are many methods of constructing buildings from Bristol board,



Typical small station suitable for a model

but the simplest is that used for the making of architects' models. This consists of drawing out on stiff card or drawing paper the buildings under construction—as shown in the diagrams (which are to scale)—and painting them with shellac varnish after they have been bent into shape and glued to a base-board.

Side Panels

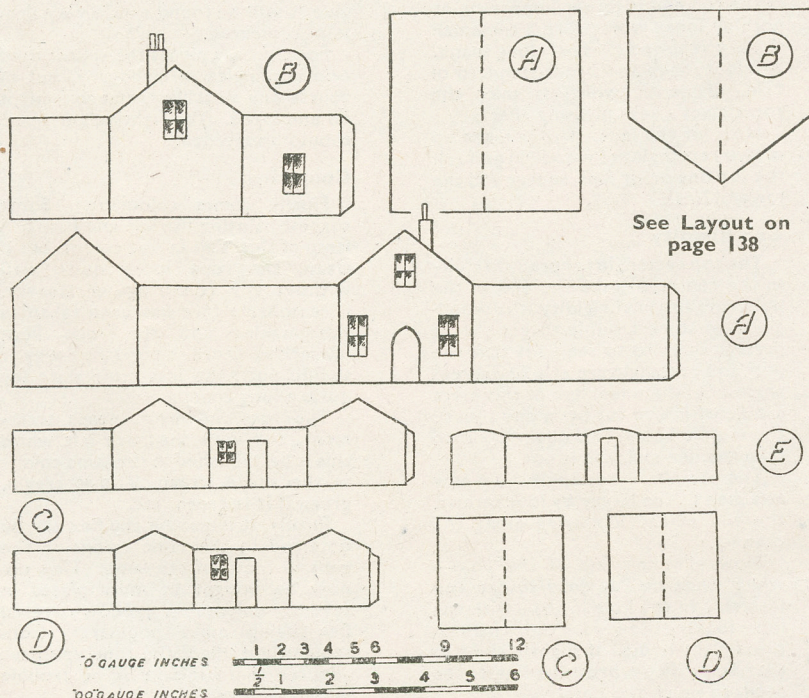
All four sides of each building should be drawn in a line as shown, and a "vee" groove cut in the back of the card at the corners (if the card is very thick) so the corners may be formed with sharpness without breaking the card. This method makes quite effective buildings, particularly if the windows and doors are carefully cut out before bending into shape.

It is possible to cut out and paste on small pieces of thin (visiting or post) card to indicate in relief, window-frames and sash-bars; even painting "curtains" or "blinds" on to the celluloid or Perspex used for "glazing" the windows. This method is excellent where casement windows are set in outside reveals, but in cases where double-hung sashes in frames are set in the usual manner behind $\frac{1}{4}$ in. reveals, it is best—in "O" gauge—to use material about $\frac{1}{8}$ in. thick or in "OO" gauge $1\frac{1}{2}$ mm.

Support Pieces

When planning the reinforcing corners of wood for such buildings be sure to arrange them so they will be so placed as to provide support for the rain-water pipes and gutters. Such pipes are made from $\frac{1}{8}$ in. copper wire for "O" gauge and from $1/16$ in. wire for "OO" scale.

The walls may be stuccoed with sand sprinkled on to the "tacky" shellac varnish, or they may be painted to represent cement. The brick-papers which are now obtainable quite easily make a very effective finish in "O" gauge, but if the bricks are carefully scribed in by hand with



See Layout on
page 138

(Continued foot of page 136)

Those who do photography should read these further ENLARGEMENT HINTS

IN the last article on Enlarging the hints given were expressly of a nature to avoid undue waste or extravagance, and to eradicate from the mind of our readers that the practice of this section of the hobby made amateur photography expensive. With this idea in the background it is the intention now to give advice which will undoubtedly prevent wastage and, at the same time, encourage the thought that "Enlarging is Picture Making". It is by carefully studying the results and genuinely criticising each that successful work of a progressive character can be achieved.

From Perfect Negatives

To begin with, it must be realised that only a perfect negative can give a perfect print. This maxim becomes much more definite when that print is an enlargement. For the very obvious reason that any blemish, no matter how small, whether it is a fog mark, pin hole or black spot on the negative, becomes enlarged also on the print. Therefore a negative should be examined for such and, if possible, the blemishes removed before attempting any further work with it.

In the same way a very flat or over-dense negative, or one that is very contrasty and lacking half-tones must not be expected to give a "pictorial" result. Then again if a negative does not give "sharp" detail in a contact print, due to movement when exposing or a slight mistake in setting the focussing scale correctly, then that lack of sharpness will be accentuated considerably in the enlargement.

This preliminary examination will unquestionably save a lot of paper, developer time and disappointment.

Portions Only

One very great advantage which will be very quickly recognised by everyone starting to use an enlarger is that it is never necessary to enlarge all the image. It is quite a simple matter to cut out any object on the side of the negative that spoils the composition of the picture and also to cut out some of the foreground or sky.

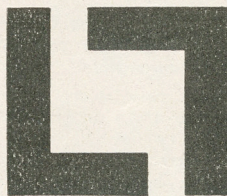
This would perhaps be better understood by a simple illustration. Let us imagine that you have a good negative of a landscape. Unfortunately in taking it you could not avoid a broken tree which had to be included on one side and an awkward piece of the roadway in the immediate foreground.

When the image is thrown on to the easel these will, of course, be

included. Well, cut them out of the picture simply by racking or placing the enlarger farther away from the easel and refocussing. You will then find a larger image on the easel and the broken tree and piece of roadway is outside the area where your piece of bromide paper is to be pinned. You now have just that section of the negative which gives the picture you desire.

Masking Cards

To help in this cutting out certain details it will be found that two pieces of black card cut to the shape of a letter "L" (see illustration) will prove most useful. When the full image is seen on the easel there may



Two cards for masking

be some uncertainty as to the advisability of cutting out any section, but, if the black "Ls" are placed in position over the section a very good idea is at once gained as to what the print will look like without it.

Exposure Aids

A well-equipped dark room will always have these pieces of black card handy and also one or two rectangular pieces. One must have a small hole in the centre and the other a larger hole. The purpose of these is to permit rather more exposure to be given on the print for any particular object or detail of the negative which you consider should appear a little darker and thus brought nearer to the foreground.

These will also prove useful for shading any portion that is included to overprint. When using these pieces it is advisable to hold them between the lens and the easel—not flat against the paper—and to give slight movement to the card. Otherwise you will find a very definite line where the light has acted and increased or, in the case of the shading decreased the exposure. It is certainly worth while making a few trials with these cards in order to become familiar.

Those who read the article about making an enlarger will remember that in the lamp chamber there was sufficient room for the lamp to be shifted either nearer to or farther from the condenser.

Before placing any negative in the enlarger first try your light on the easel to see if an even illuminated disc appears. If there happens to be any dark patch or a colour fringe on the edges it indicates that the lamp is either too near or too far from the condenser. This must be adjusted and you will, by a slight movement of the lamp, get a perfectly illuminated easel, and so avoid a "patchy" print.

Preventing Waste

Having taken a sheet of paper from its packet do be sure to close the packet and place it in a drawer or where it cannot be exposed to the light from the enlarger. Make this a hard and fast rule. Many sheets of good bromide paper can be quickly spoiled by stray light.

If the resulting prints after drying show irregular brown stains it is a sure indication that you are using (1) an exhausted fixing bath, (2) allowing the prints to overlap in the fixing bath, or (3) allowing too much time for examining the print after taking it from the developer and before plunging it completely into the fixing bath.

Rinse Before Examination

The last mentioned is quite a common fault. If it is necessary to examine a print while it is undergoing development it must be well rinsed under running water to remove whatever developing solution is on its surface. All developers tend to oxidise on exposure to air and this causes a brown stain which cannot be removed.

The quickest way to destroy surface developer solution remaining on the print is to immerse it in a Stop Bath consisting of $\frac{1}{2}$ oz. Potass. Metabisulphite dissolved in 20 ounces of water. Use this bath for about 3 minutes' soaking, before placing the print in the fixing bath.

MODEL MOTOR CAR

This week's Design

THIS week's gift pattern sheet is for making a strong model toy motor car 11ins. long. The planed wood, set of turned wheels and axle rod are supplied by Hobbies from their branches or agencies for 3/9 or by post from Dereham, Norfolk, for 4/6

Some helpful replies of subjects dealing with WHAT, HOW AND WHY

IRECENTLY purchased a new electrical gramophone motor, of the rim-drive type, with a 9in. turntable. I am rather curious to know how the latter has been covered so neatly with a thin, brown material.

GRAMOPHONE turntables are generally covered with thin velvet-reen or something similar, affixed with a special adhesive and a tight-fitting, plated rim. However, in the case of new, up-to-date motors, complete with turntable, etc., a fabric finish is usually applied. In this case, the bare metal is sprayed with an adhesive and, within 10 minutes, covered with a rayon powder, applied with a special gun, known as a fibre-gun, to which is attached a container filled with the powder. Spraytex is the trade-name of the process and anyone can soon learn to use the adhesives and spraying powders. It is just as easy as using a spray-paint outfit.

* * *

WHY does the mains transformer, which I built, seem to hum and rattle so much?

ONE reason is a loose "core" or winding limb. This is the central part of the stalloy stampings, formed by the "leg" of the T-shaped pieces. You must have these packed tightly into the bobbin carrying the windings of wire. Inspection might show that the upper, or lower, T-shaped piece has a "loose" leg which vibrates within the bobbin, due to the alternating nature of the current. Extra stampings should be fitted, or stiff cardboard or paxolin strips. The latter is best, particularly if the windings are planned to suit 6 dozen pairs of stalloy stampings, at say, 8 turns per volt. One or two extra core pieces will not, of course, make much difference.

Model Railway—(Continued from page 134)

a straight-edge and a blunt knitting-needle, a much more convincing job will result. This work is well worth the extra trouble, and is a work of art instead of a machine-made copy of meticulous, unerring accuracy.

Construction

Dealing with the construction of the buildings for the small station illustrated, it will be seen from the plan that there are four main buildings flanking the down platform, whilst the front elevation shows that each building is of four-square plan with simple roofing. The shape of the card strips which on folding produce the four walls of each building are shown (flat) at A, B, C, and D; these same letters keying in with the plan.

It will be found easiest to re-draw

WHAT is a ball-pen, please, and how does it work?

ABALL-POINTED pen is, like almost simple things, an ingenious form of writing device, a tiny metal ball taking the place of a nib. In use, the ball "rolls" over the paper, and being in contact with a sticky ink, it carries traces of the ink which is thus applied to the paper. A refill of ink lasts for six months, and an advantage of the special ink is that it writes "dry" on any kind of paper—even blotting paper. Such a pen is handy for filling forms, coupons, etc., printed on a cheap paper, such as newsprint paper. Ordinary writing ink rather "spreads" on such paper, of course.

* * *

ARE electric or mechanical shavers any good? It seems to me that a close shave is impossible.

AREALLY close shave is impossible, due to the thin guard which is a necessity on all mechanical shaving devices. After all, an electric, or clockwork, shaver operates much in the same way as hair clippers. The principle is similar, if the action is different. With care, a reasonably close shave is obtained—close enough to last for a day, at least. As the shaving is dry, the shavers can be used at any time, once in the morning, and again in the late evening, if necessary.

* * *

HOW can I obtain a silvery effect on some display stands I have made for a window. I do not want to use aluminium paint or anything like that. I want something that glitters.

IN other words, a crystalline effect is desired. This is possible with a modern finishing powder, known as

Dewspray, it being a silvery, crystal-line powder which is sprayed upon surfaces treated with a slow air-drying adhesive. While an ordinary spray-gun outfit, having an output of 2 c.f.m. at 30 lb. per sq. in., can be used for applying the adhesive, a special gun, with air and powder control, may be needed for the silver powder, such as the type used for spraying textile powders.

* * *

IN making a metal chassis for a small receiver, I broke all my metal-cutting fretsaw blades trying to cut holes for the valve bases. Are these holes, in sheet iron, drilled? If so, where can I get drills for boring tin holes?

IF you used sheet iron for making the chassis, it is no wonder that the metal-cutting blades did not stand up to the cutting. Aluminium is just as good as sheet iron or mild steel. It is much easier cut with the blades. In the case of sheet iron, mild steel, etc., any size of hole, from 1in. to 3ins., can be cut with a device known as a tank-cutter. It consists of a shank, fitted with a short 1/2in. drill and an adjustable cutter. When fixed in a brace, it is used just like a centre bit, the drill boring an 1/2in. hole first and serving to keep the cutter working truly. Special cutters, for radio chassis work, are obtainable at most radio stores, or any local hardware-tool shops. If using a soft aluminium of 16 s.w.g., an old 1in. centre bit could be used, boring an 1/2in. hole for the point, then scribing the radius of the hole at both sides of the sheet metal. Only the scriber, and not the cutter, is used of course. If necessary, the cutter could be ground away, leaving the scriber to do the necessary cutting.

these "wall" strips to your own scale, using the scale of inches and feet shown below the diagrams; which are all to the same scale, but reduced to fit the size of these pages. As has been mentioned, this re-drawing can take place directly on to the sheet of card or three-ply being used for the construction.

If Bristol board is being used, then the small tags must be left where shown for sticking the walls into square form, but if fretwood or three-ply is chosen for the larger scale, then care must be taken to deduct from the length of each end (gabled) twice the thickness of the material being used; otherwise your finished buildings will be just that amount bigger in area.

If your railway is a portable or

semi-portable one, it will be advisable to mount each building on its own foundation, or alternatively, the whole run of buildings could be mounted on a sub-base, upon which the platforms could also be fixed at their correct (clearance) distance from the track or tracks.

A view of the station and lay-out of lines etc., is given on page 138.

The siding shown on the plan is optional, and is arranged so that standard points may be used. The siding may be extended as desired to the right to house the longest goods train likely to use the siding.

Finally. Take great care to cut and stick everything dead square, for this is the secret of good modelling.

(To be Continued)

Ensure long service by a little attention to ACCUMULATOR CARE

THE accumulators used for operating motors and models, for lighting and starting in motors and other vehicles, and for driving radio receivers and other apparatus, can give many long years of almost trouble-free service. If not treated properly they can also be a nuisance, which is a pity because a little practical knowledge is all that is required to keep them in proper order and obtain the longest period of useful life from them.

What an Accumulator Does

An accumulator is called a secondary cell because it does not generate current (as with a dry cell) but only stores the current put into it. The ordinary accumulator plates are made from red lead pressed into a lead framework.

The plates are immersed in sulphuric acid; during charge sulphate

condition, or its capacity will be reduced.

Adding Distilled Water

Areas of the plates above the acid cannot function, so distilled water is added to make up for that lost by evaporation. The specific gravity of water is 1.000. Being less dense it will therefore float on the surface of the acid and if the hydrometer (shown in Fig. 1) is used to draw liquid from near the top of the cell after adding water a wrong reading may result. To avoid this, insert the tube well down in the battery and press the bulb several times to mix the acid.

If acid is lost from the cell by spilling, make up the level with dilute sulphuric acid (specific gravity about 1.200). The specific gravity of stronger acid can be reduced by adding distilled water.

Troubles to Avoid

Fig. 2 shows the more serious

long period sulphate forms on the plates. If severe, this makes the cell almost useless as the crystals act as an insulator between acid and plate. A long period of charge at about one quarter the usual rate will get the cell back into proper condition.

Low acid level reduces the capacity and may result in hard crystals forming on the exposed parts of the plates. So each cell in an accumulator should be filled up so that the plates are covered.

Corrosion, which may eat away terminals and leads, can be reduced considerably by careful scraping and drying. Afterwards the terminals should be smeared with petroleum jelly (Vaseline) because this stops corrosion.

Cracked plates are due to rough handling or standing in a discharged condition. If the accumulator has several cells and the others are in good condition, new plates can be fitted in the defective section. This is sometimes worthwhile in large accumulators.

Non-Spillable Cells

From time to time a few drops of distilled water should be added to the vent of non-spillable cells, excess being poured off afterwards. The acid in accumulators may be jellyfied by mixing one part of pure sodium silicate (1.200 specific gravity) to three parts of sulphuric acid (1.400 specific gravity), making sufficient to fill the cell.

The old free acid should then be poured out immediately and the mixture poured in until the accumulator is nearly full. The cell should then be left undisturbed for five to ten minutes, when jellyfication will be complete.

Such treatment is only worth while where a non-spillable battery is required, that is, for portable wireless sets and, in some cases, for accumulators used to drive models.

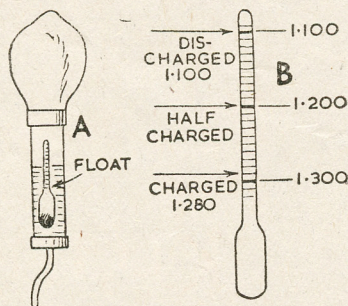


Fig. 1—How specific gravity is measured

is driven off, thereby causing an increase in the specific gravity of the acid. The reverse takes place during discharge.

Measuring Specific Gravity

This means the state of the cell can be found by measuring the specific gravity of the acid. To do this, a tester such as that shown at "A" in Fig. 1 is used. By means of the rubber bulb acid is drawn up into the glass tube, this causing the float (shown in detail at "B") to rise.

The depth to which the float sinks depends upon the specific gravity of the acid, and the figure on the scale which comes level with the surface of the acid is that giving the gravity.

The usual gravity for various states of charge are shown. As the cell is discharged the float will gradually sink, until a specific gravity of about 1.110 indicates that it is fully discharged.

For preference a cell should not be allowed to discharge completely. It should never be allowed to stand any length of time in a discharged

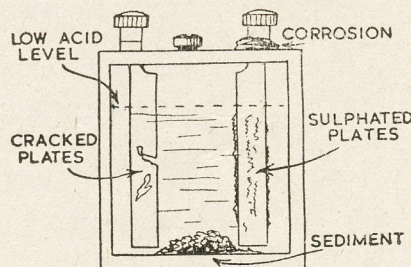


Fig. 2—Some troubles to avoid

troubles to avoid. Rough handling and short-circuiting will make flakes of material fall from the plates. These form a sediment at the bottom, and short circuit the plates internally because the fragments contain lead. If there is much sediment the cell should be charged up, then cleaned out, washing with distilled water. Afterwards fill up with clean acid.

If a cell remains discharged for a

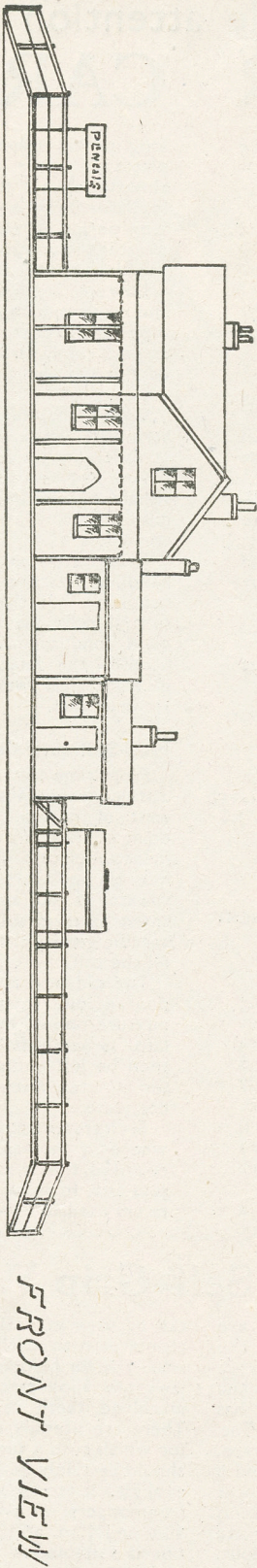
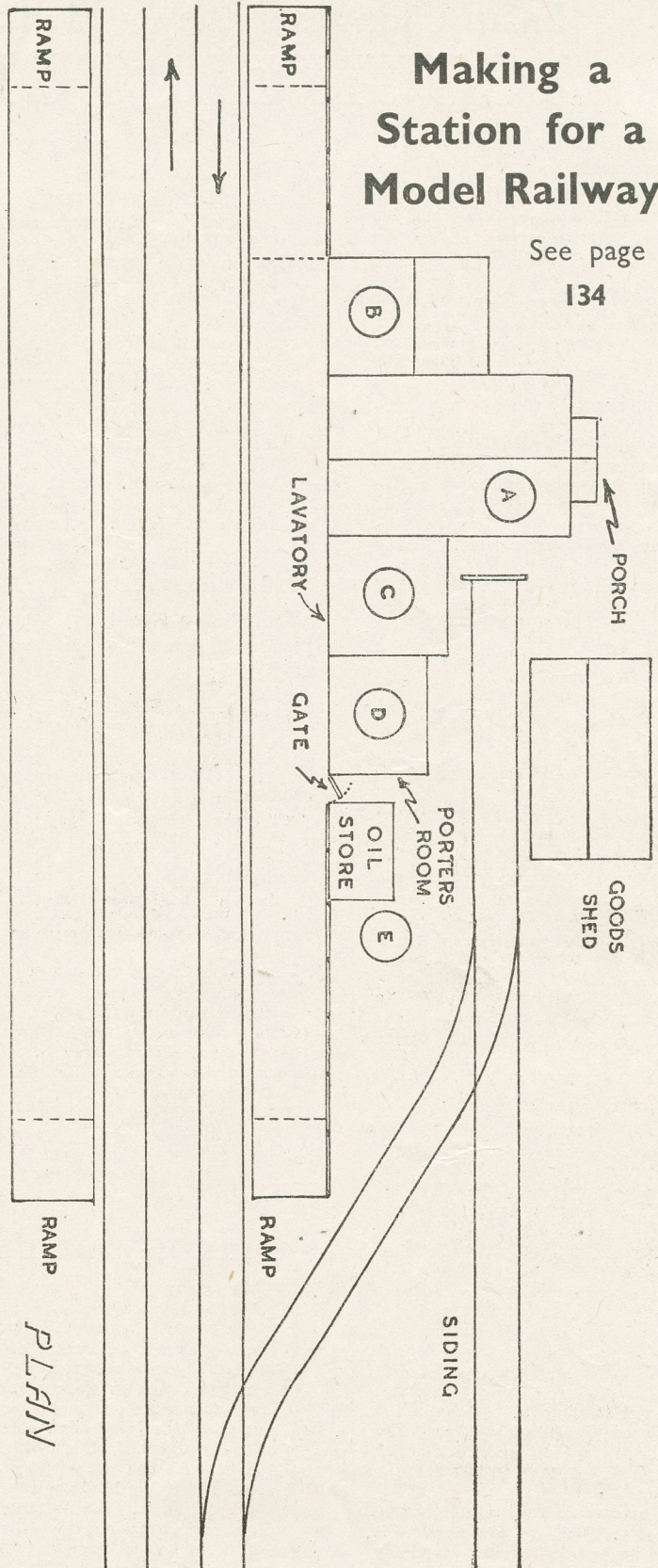
Handyman's Self-Grip Wrench

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Making a Station for a Model Railway

See page
134



INCHES 1 2 3 4 5 6 9 1 FOOT 18 INS. 2 FOOT 3 4 5 FOR "O" GAUGE
INCHES 2 3 4 5 6 7 8 9 10 11 1 FOOT 15 INS 18 INS 21 INS FOR "OO" GAUGE

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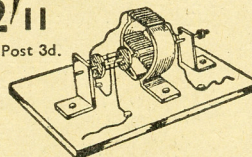
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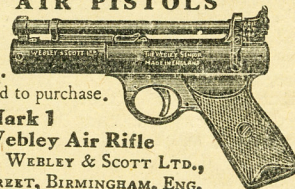
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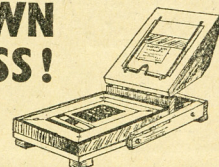


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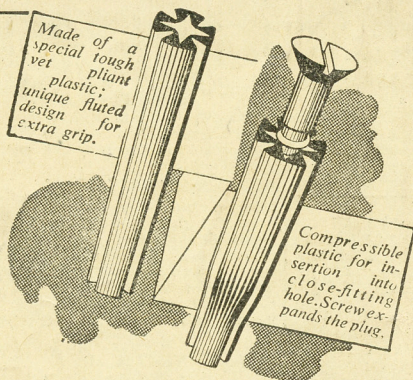
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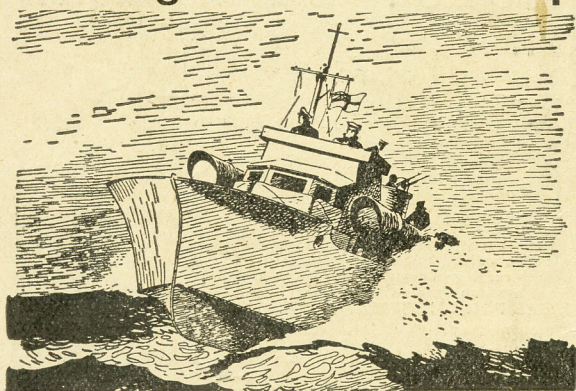
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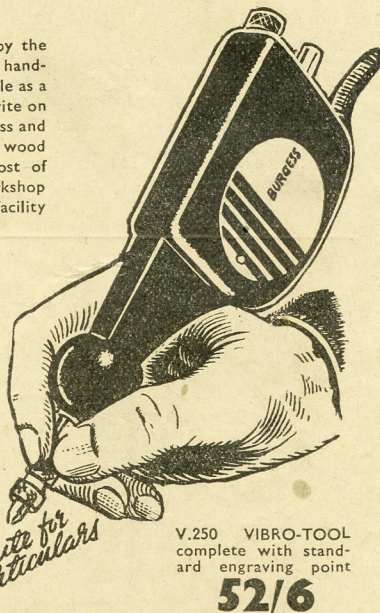
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